

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method of processing a network device operating system operation, the method comprising the computer-implemented steps of:
receiving, from each of several network device operating system components, callback registration information that specifies indicates the network device operating system operations supported by the network device operating system component and that establishes a callback for providing (a) a network device operating system operation and associated (b) data associated with the operation to the network device operating system component;
receiving (a) the network device operating system operation and (b) associated data associated with the operation within an Extensible Markup Language (XML) document;
parsing the XML document to identify the network device operating system operation;
selecting, based on the callback registration information, one of the several network device operating system components that supports can process the identified network device operating system operation, where the callback registration information received from the selected one of several network device operating system components specifies indicates that the identified network device operating system operation is supported by the selected one of several network device operating system components;
preparing the associated data associated with the operation for use by the selected one of several network device operating system component~~[[s]]~~; and
providing the identified network device operating system operation and the prepared data in the callback established by to the selected one of the several network device operating system component[[s]] that was established by the callback registration information received from the selected one of several network device operating system components.

2. (Currently amended) The method of Claim 1, further comprising the steps of:
receiving responsive data that reflects the results of performing said identified network device operating system operation from the selected one of the several network device operating system components;

- creating a responsive XML document that contains the responsive data in XML format;
and
sending the responsive XML document to a network management application.
3. (Original) The method of Claim 1, wherein the XML document is received within a transport protocol message that conforms to one of several transport protocols, and further comprising the step of extracting the XML document from the transport protocol message.
4. (Original) The method of Claim 1, further comprising the steps of:
at the selected one of the several network device operating system components,
processing the identified network device operating system operation in preparation for invoking a function that can perform one or more tasks associated with the operation; and
invoking the function defined by the network device operating system component that can perform the one or more tasks associated with the operation.
5. (Previously Presented) The method of Claim 4, wherein the XML document includes data associated with the network device operating system operation, and wherein the step of processing the identified network device operating system operation in preparation for invoking the function comprises:
validating the data associated with the network device operating system operation; and
mapping the data to one or more data structures that are associated with the function.
6. (Currently amended) The method of Claim 1, further comprising the steps of:
receiving, in the XML document, a query from a network management application about the several network device operating~~tion~~ system components that are supported; and
providing a response to the network management application that identifies one or more of the several network device operating~~tion~~ system components that are supported.
7. (Original) The method of Claim 1, further comprising the steps of:

- receiving, in the XML document, a query from a network management application about one or more of several objects that are supported by the several components; and providing a response to the network management application that identifies one or more of the objects that are supported.
8. (Previously Presented) The method as recited in Claim 7, further comprising the steps of: receiving, in the XML document, a query from a network management application about one or more of several methods that are supported by the objects; and providing a response to the network management application that identifies one or more of the methods that are supported.
9. (Original) The method as recited in Claim 7, further comprising the steps of: receiving, in the XML document, a query from a network management application about one or more of several attributes that are supported by the methods; and providing a response to the network management application that identifies one or more of the attributes that are supported.
10. (Original) The method as recited in Claim 1, further comprising the steps of: receiving, in the XML document, an invocation by a network management application of one or more of several methods that are implemented by one or more objects of the several components; and invoking the one or more methods through a callback to one or more of the components.
11. (Currently amended) A computer-readable storage medium for processing a network operating system operation for a network device, comprising:
a plurality of network device operating system components comprising instructions for performing network device operating system operations;
XML infrastructure logic comprising instructions for receiving (a) a the-network operating system operation and associated (b) data associated with the operation within an Extensible Markup Language (XML) document; and
programmatic agent infrastructure logic comprising instructions for:
receiving, from each of several network device operating system components, callback registration information that specifies indicates the network device operating system operations supported by the network device

operating system component and that establishes a callback for providing
~~(a) the {{a}}~~network device operating system operation and ~~associated (b)~~
data associated with the operation to the network device operating system
component,

parsing the XML document to identify the network device operating system
operation,

selecting one of the several network device operating system components that
supports ~~can process~~ the identified network device operating system
operation, where the callback registration information received from the
selected one of several network device operating system components
specifies ~~indicates~~ that the identified network device operating system
operation is supported by the selected one of several network device
operating system components,

preparing the ~~associated data~~ associated with the operation for use by the selected
one of several network device operating system component~~ts~~, and
providing the identified network device operating system operation and the
prepared data in the callback established by ~~to~~ the selected ~~one of the~~
~~several~~ network device operating system component~~ts~~ ~~that was~~
~~established by the callback registration information received from the~~
~~selected one of several network device operating system components.~~

12. (Previously Presented) The computer-readable storage medium as recited in Claim 11,
wherein each of the network device operating system components comprises:
component XML logic that implements one or more of the callbacks to which the
identified network device operating system operation and the prepared data are
provided by the programmatic agent infrastructure logic;
component API logic that provides an application programming interface for one or more
functions of the network device operating system component.
13. (Previously Presented) The computer-readable storage medium as recited in Claim 12,
wherein the component XML logic further comprises instructions for data validation of
the data associated with the identified network device operating system operation and for

mapping the data to one or more data structures that are associated with the one or more functions.

14. (Currently amended) A computer-readable storage medium storing one or more sequences of instructions for processing a network device operating system operation, which instructions, when executed by one or more processors, cause the one or more processors to perform the steps of:
 - receiving, from each of several network device operating system components, callback registration information that specifies ~~indicates~~ the network device operating system operations supported by the network device operating system component and that establishes a callback for providing (a) a network device operating system operation and ~~associated-(b)~~ data associated with the operation to the network device operating system component;
 - receiving (a) the network device operating system operation and (b) ~~associated-data~~ associated with the operation within an Extensible Markup Language (XML) document;
 - parsing the XML document to identify the network device operating system operation;
 - selecting, based on the callback registration information, one of the several network device operating system components that supports ~~can process~~ the identified network device operating system operation, where the callback registration information received from the selected one of several network device operating system components specifies ~~indicates~~ that the identified network device operating system operation is supported by the selected one of several network device operating system components;
 - preparing the ~~associated-data~~ associated with the operation for use by the selected one of several network device operating system component{[s]}; and
 - providing the identified network device operating system operation and the prepared data in the callback established by ~~to~~ the selected ~~one of the several~~ network device operating system component{[s]} ~~that was established by the callback registration information received from the selected one of several network device operating system components.~~

15. (Currently amended) The computer-readable storage medium as recited in Claim 14, further comprising instructions, which when executed by the one or more processors, cause the one or more processors to perform the steps of:
receiving responsive data that reflects the results of performing said identified network device operating system operation from the selected one of the several network device operating system components;
creating a responsive XML document that contains the responsive data in XML format;
and
sending the responsive XML document to a network management application.
16. (Previously Presented) The computer-readable storage medium as recited in Claim 14, wherein the XML document is received within a transport protocol message that conforms to one of several transport protocols, and further comprising instructions, which when executed by the one or more processors, cause the one or more processors to perform the step of extracting the XML document from the transport protocol message.
17. (Previously Presented) The computer-readable storage medium as recited in Claim 14, further comprising instructions, which when executed by the one or more processors, cause the one or more processors to perform the steps of:
at the selected one of the several network device operating system components,
processing the identified network device operating system operation in preparation for invoking a function that can perform one or more tasks associated with the operation; and
invoking the function defined by the network device operating system component that can perform the one or more tasks associated with the operation.
18. (Previously Presented) The computer-readable storage medium as recited in Claim 17, wherein the XML document includes data associated with the network device operating system operation, and wherein the step of processing the identified network device operating system operation in preparation for invoking the function comprises:
validating the data associated with the network device operating system operation; and
mapping the data to one or more data structures that are associated with the function.

19. (Currently amended) The computer-readable storage medium as recited in Claim 14, further comprising instructions, which when executed by the one or more processors, cause the one or more processors to perform the steps of:
receiving, in the XML document, a query from a network management application about the several network device operating~~ing~~ system components that are supported;
and
providing a response to the network management application that identifies one or more of the several network device operating~~ing~~ system components that are supported.
20. (Previously Presented) The computer-readable storage medium as recited in Claim 14, further comprising instructions, which when executed by the one or more processors, cause the one or more processors to perform the steps of:
receiving, in the XML document, a query from a network management application about one or more of several objects that are supported by the several components; and
providing a response to the network management application that identifies one or more of the objects that are supported.
21. (Previously Presented) The computer-readable storage medium as recited in Claim 20, further comprising instructions, which when executed by the one or more processors, cause the one or more processors to perform the steps of:
receiving, in the XML document, a query from a network management application about one or more of several methods that are supported by the objects; and
providing a response to the network management application that identifies one or more of the methods that are supported.
22. (Previously Presented) The computer-readable storage medium as recited in Claim 20, further comprising instructions, which when executed by the one or more processors, cause the one or more processors to perform the steps of:
receiving, in the XML document, a query from a network management application about one or more of several attributes that are supported by the methods; and
providing a response to the network management application that identifies one or more of the attributes that are supported.

23. (Previously Presented) The computer-readable storage medium as recited in Claim 14, further comprising instructions, which when executed by the one or more processors, cause the one or more processors to perform the steps of:
- receiving, in the XML document, an invocation by a network management application of one or more of several methods that are implemented by one or more objects of the several components; and
- invoking the one or more methods through a callback to one or more of the components.
24. (Currently amended) An apparatus for processing a network device operating system operation, comprising:
- at least one processor;
- means for receiving, from each of several network device operating system components, callback registration information that ~~specifies indicates~~ the network device operating system operations supported by the network device operating system component and that establishes a callback for providing (a) a network device operating system operation and ~~associated-(b)~~ data associated with the operation to the network device operating system component;
- means for receiving (a) the network device operating system operation and (b) ~~associated~~ data associated with the operation within an Extensible Markup Language (XML) document;
- means for parsing the XML document to identify the network device operating system operation;
- means for selecting, based on the callback registration information, one of the several network device operating system components that supports ~~can process~~ the identified network device operating system operation, where the callback registration information received from the selected one of several network device operating system components ~~specifies indicates~~ that the identified network device operating system operation is supported by the selected one of several network device operating system components;
- means for preparing the ~~associated data~~ data associated with the operation for use by the selected one of several network device operating system component[+]; and
- means for providing the identified network device operating system operation and the prepared data in the callback established by ~~to the selected one of the several~~

~~network device operating system component{{s}} that was established by the
callback registration information received from the selected one of several
network device operating system components.~~

25. (Currently amended) The apparatus of Claim 24, further comprising:
means for receiving responsive data that reflects the results of performing said identified
network device operating system operation from the selected one of the several
network device operating system components;
means for creating a responsive XML document that contains the responsive data in
XML format; and
means for sending the responsive XML document to a network management application.
26. (Previously Presented) The apparatus of Claim 24, wherein the XML document is
received within a transport protocol message that conforms to one of several transport
protocols, and further comprising means for extracting the XML document from the
transport protocol message.
27. (Previously Presented) The apparatus of Claim 24, further comprising:
means for processing the identified network device operating system operation in
preparation for invoking a function that can perform one or more tasks associated
with the operation; and
means for invoking the function defined by the network device operating system
component that can perform the one or more tasks associated with the operation.
28. (Previously Presented) The apparatus of Claim 27, wherein the XML document includes
data associated with the network device operating system operation, and wherein the
means for processing the identified network device operating system operation in
preparation for invoking the function comprises:
means for validating the data associated with the network device operating system
operation; and
means for mapping the data to one or more data structures that are associated with the
function.
29. (Currently amended) The apparatus of Claim 24, further comprising:

means for receiving, in the XML document, a query from a network management application about the several network device operating~~g{f}{on}}~~ system components that are supported; and

means for providing a response to the network management application that identifies one or more of the several network device operating~~g{f}{on}}~~ system components that are supported.

30. (Previously Presented) The apparatus of Claim 24, further comprising:
means for receiving, in the XML document, a query from a network management application about one or more of several objects that are supported by the several components; and
means for providing a response to the network management application that identifies one or more of the objects that are supported.
31. (Previously Presented) The apparatus of Claim 30, further comprising the steps of:
means for receiving, in the XML document, a query from a network management application about one or more of several methods that are supported by the objects; and
means for providing a response to the network management application that identifies one or more of the methods that are supported.
32. (Previously Presented) The apparatus of Claim 30, further comprising the steps of:
means for receiving, in the XML document, a query from a network management application about one or more of several attributes that are supported by the methods; and
means for providing a response to the network management application that identifies one or more of the attributes that are supported.
33. (Previously Presented) The apparatus of Claim 24, further comprising:
means for receiving, in the XML document, an invocation by a network management application of one or more of several methods that are implemented by one or more objects of the several components; and
means for invoking the one or more methods through a callback to one or more of the components.

34. (Currently amended) An apparatus for processing a network device operating system operation, comprising:

a network interface that is coupled to a data network for receiving one or more packet flows therefrom;

a processor; and

one or more stored sequences of instructions which, when executed by the processor, cause the processor to perform the steps of:

receiving, from each of several network device operating system components, callback registration information that specifies ~~indicates~~ the network device operating system operations supported by the network device operating system component and that establishes a callback for providing (a) a network device operating system operation and ~~associated~~ (b) data associated with the operation to the network device operating system component;

receiving (a) the network device operating system operation and (b) ~~associated~~ data associated with the operation within an Extensible Markup Language (XML) document;

parsing the XML document to identify the network device operating system operation;

selecting, based on the callback registration information, one of the several network device operating system components that supports ~~can process~~ the identified network device operating system operation, where the callback registration information received from the selected one of several network device operating system components specifies ~~indicates~~ that the identified network device operating system operation is supported by the selected one of several network device operating system components;

preparing the ~~associated data~~ associated with the operation for use by the selected one of several network device operating system component{f+s}; and

providing the identified network device operating system operation and the prepared data in the callback established by ~~to~~ the selected ~~one of the several~~ network device operating system component{f+s} that was

~~established by the callback registration information received from the
selected one of several network device operating system components.~~

35. (Currently amended) The apparatus of Claim 34, further comprising instructions, which when executed by the processor, cause the processor to perform the steps of:
receiving responsive data that reflects the results of performing said identified network device operating system operation from the selected one of the several network device operating system components;
creating a responsive XML document that contains the responsive data in XML format;
and
sending the responsive XML document to a network management application.
36. (Original) The apparatus of Claim 34, wherein the XML document is received within a transport protocol message that conforms to one of several transport protocols, and further comprising instructions, which when executed by the processor, cause the processor to perform the step of extracting the XML document from the transport protocol message.
37. (Original) The apparatus of Claim 34, further comprising instructions, which when executed by the processor, cause the processor to perform the steps of:
at the selected one of the several network device operating system components,
processing the identified network device operating system operation in preparation for invoking a function that can perform one or more tasks associated with the operation; and
invoking the function defined by the network device operating system component that can perform the one or more tasks associated with the operation.
38. (Previously Presented) The apparatus of Claim 37, wherein the XML document includes data associated with the network device operating system operation, and wherein the step of processing the identified network device operating system operation in preparation for invoking the function comprises:
validating the data associated with the network device operating system operation; and
mapping the data to one or more data structures that are associated with the function.

39. (Currently amended) The apparatus of Claim 34, further comprising instructions, which when executed by the processor, cause the processor to perform the steps of:
receiving, in the XML document, a query from a network management application about
the several network device operating~~ing~~ system components that are supported;
and
providing a response to the network management application that identifies one or more
of the several network device operating~~ing~~ system components that are
supported.
40. (Original) The apparatus of Claim 34, further comprising instructions, which when executed by the processor, cause the processor to perform the steps of:
receiving, in the XML document, a query from a network management application about
one or more of several objects that are supported by the several components; and
providing a response to the network management application that identifies one or more
of the objects that are supported.
41. (Previously Presented) The apparatus of Claim 40, further comprising instructions, which when executed by the processor, cause the processor to perform the steps of:
receiving, in the XML document, a query from a network management application about
one or more of several methods that are supported by the objects; and
providing a response to the network management application that identifies one or more
of the methods that are supported.
42. (Original) The apparatus of Claim 40, further comprising instructions, which when executed by the processor, cause the processor to perform the steps of:
receiving, in the XML document, a query from a network management application about
one or more of several attributes that are supported by the methods; and
providing a response to the network management application that identifies one or more
of the attributes that are supported.
43. (Original) The apparatus of Claim 34, further comprising instructions, which when executed by the processor, cause the processor to perform the steps of:

receiving, in the XML document, an invocation by a network management application of one or more of several methods that are implemented by one or more objects of the several components; and
invoking the one or more methods through a callback to one or more of the components.